

AMENDMENT UNDER 37 CFR § 1.111
Appln. No.: 09/924,546

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (currently amended): A battery separator consisting essentially of a nonwoven fabric having a substantially unilayered structure, wherein an apparent total surface area of fibers per a surface density of said nonwoven fabric is 20 m^2 or more, a thickness of said nonwoven fabric is 0.1 mm or less, a uniformity index of said nonwoven fabric is 0.15 or less, said nonwoven fabric consists essentially of non-fibrillated fibers, ~~and~~ said nonwoven fabric contains fine fibers having a fiber diameter of $4\mu\text{m}$ or less and high-modulus fibers having a Young's modulus of 50 cN/dtex or more, and the fine fibers are formed from island components remaining after removing a sea component from islands-in-sea composite fibers.

2. (canceled).

3. (canceled).

4. (canceled).

5. (original): The battery separator according to claim 1, wherein the nonwoven fabric contains fusible fibers.

AMENDMENT UNDER 37 CFR § 1.111
Appln. No.: 09/924,546

6. (original): The battery separator according to claim 1, wherein the nonwoven fabric contains the fine fibers, high-modulus fibers and fusible fibers.

7. (original): The battery separator according to claim 6, wherein a combination ratio of the fine fibers : the high-modulus fibers : the fusible fibers in terms of mass is 10 to 40 : 15 to 40 : 20 to 75.

8. (previously presented): The battery separator according to claim 6 or 7, wherein an average fiber diameter of the high-modulus fibers is 5 times or more an average fiber diameter of the fine fibers.

9. (previously presented): : The battery separator according to claim 6 or 7, wherein an average fiber length of the high-modulus fibers is 2.5 times or more an average fiber length of the fine fibers.

10. (canceled).

11. (original): The battery separator according to claim 1, wherein the fibers forming the nonwoven fabric are fixed substantially only by fusing the fibers to each other.

12. (original): The battery separator according to claim 1, wherein a maximum pore size in the nonwoven fabric is 40 μm or less.

13. (original): The battery separator according to claim 1, wherein a void rate of the nonwoven fabric is 45 to 65 %.

14. (original): The battery separator according to claim 1, wherein a tensile strength of the nonwoven fabric in at least one direction is 20 N/5cm width or more.

15. (original): The battery separator according to claim 1, wherein the nonwoven fabric is subjected to a treatment for imparting a hydrophilic property, selected from a group consisting of a sulfonating treatment, a treatment with fluorine gas, a graft polymerization treatment with vinyl monomers, and a discharging treatment.

16. (canceled).

17. (new): A battery separator consisting essentially of a nonwoven fabric having a substantially unilayered structure, wherein an apparent total surface area of fibers per a surface density of said nonwoven fabric is 20 m^2 or more, a thickness of said nonwoven fabric is 0.1 mm or less, a uniformity index of said nonwoven fabric is 0.15 or less, said nonwoven fabric consists essentially of non-fibrillated fibers, said nonwoven fabric contains fine fibers having a fiber diameter of $4 \text{ }\mu\text{m}$ or less and high-modulus fibers having Young's modules of 50 cN/dtex or more, and said nonwoven fabric consists essentially of polyolefin-based fibers.

AMENDMENT UNDER 37 CFR § 1.111
Appln. No.: 09/924,546

18. (new): The battery separator according to claim 17, wherein the nonwoven fabric contains fusible fibers.

19. (new): The battery separator according to claim 17, wherein the nonwoven fabric contains the fine fibers, high-modulus fibers and fusible fibers.

20. (new): The battery separator according to claim 19, wherein combination ration of the fine fibers: the high-modulus fibers: the fusible fibers in terms of mass is 10 to 40 : 15 to 40 : 20 to 75.

21. (new): The battery separator according to claim 19 or 20, wherein an average fiber length of the high-modulus fibers is 2.5 times or more an average fiber diameter of the high-modulus fibers is 5 times or more an average fiber diameter of the fine fibers.

22. (new): The batter separator according to claim 19 or 20, wherein an average fiber length of the high-modulus fibers is 2.5 times or more an average fiber length of the fine fibers.

23. (new): The battery separator according to claim 17, wherein the fibers forming the nonwoven fabric are fixed substantially only by fusing the fibers to each other.

24. (new): The battery separator according to claim 17, wherein a maximum pore size in the nonwoven fabric is 40 μm or less.

25. (new): The battery separator according to claim 17, wherein a void rate of the nonwoven fabric is 45 to 65%.

26. (new): The battery separator according to claim 17, wherein a tensile strength of the nonwoven fabric in at least one direction is 20 N/5cm width or more.

27. (new): The battery separator according to claim 17, wherein the nonwoven fabric is subjected to a treatment for imparting a hydrophilic property, selected from a group consisting of a sulfonating treatment, a treatment with fluorine gas, a graft polymerization treatment with vinyl monomers, and a discharging treatment.

28. (new): A battery separator consisting essentially of a nonwoven fabric having a substantially unilyered structure, wherein an apparent total surface area of fibers per a surface density of said nonwoven fabric is 20 m² or more, a thickness of said nonwoven fabric is 0.1 mm or less, a uniformity index of said nonwoven fabric is 0.15 or less, said nonwoven fabric consists essentially of non-fibrillated fibers, said nonwoven fabric contains fine fibers having a fiber diameter of 4 μm or less and high-modulus fibers having a Young's modulus of 50 cN/dtex or more, and surfaces of the fibers forming the nonwoven fabric consist essentially of a polypropylene resin.

AMENDMENT UNDER 37 CFR § 1.111

Appln. No.: 09/924,546

29. (new): The battery separator according to claim 28, wherein the nonwoven fabric contains fusible fibers.

30. (new): The battery separator according to claim 28, wherein the nonwoven fabric contains the fine fibers, high-modulus fibers and fusible fibers.

31. (new): The battery separator according to claim 30, wherein a combination ratio of the fine fibers: the high-modulus fibers: the fusible fibers in terms of mass is 10 to 40 : 15 to 40 : 20 to 75.

32. (new): The battery separator according to claim 30 or 31, wherein an average fiber diameter of the high-modulus fibers is 5 times or more an average fiber diameter of the fine fibers.

33. (new): The battery separator according to claim 30 or 31, wherein an average fiber length of the high-modulus fibers is 2.5 times or more an average fiber length of the fine fibers.

34. (new): The battery separator according to claim 28, wherein the fibers forming the nonwoven fabric are fixed substantially only by fusing the fibers to each other.

35. (new): The battery separator according to claim 28, wherein a maximum pore size in the nonwoven fabric is 40 μm or less.

AMENDMENT UNDER 37 CFR § 1.111
Appln. No.: 09/924,546

36. (new): The battery separator according to claim 28, wherein a void rate of the nonwoven fabric is 45 to 65%

37. (new): The battery separator according to claim 28, wherein a tensile strength of the nonwoven fabric in at least one direction is 20 N/5cm width or more.

38. (new): The battery separator according to claim 28, wherein the nonwoven fabric is subjected to a treatment for imparting a hydrophilic property, selected from a group consisting of a sulfonating treatment, a treatment with fluorine gas, a graft polymerization treatment with vinyl monomers, and a discharging treatment.